AlphaNet™ DSM Series
External DOCSIS Transponder

Technical Manual
Model XP-EDH-A

Effective: June 2006

Alpha Technologies

Alpha Technologies

Power

AlphaNet™ DSM Series
External DOCSIS Transponder
Model XP-EDH-A
Technical Manual

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Safety Notes

Review the drawings and illustrations contained in this manual before proceeding. If there are any questions regarding the safe installation or operation of the system, contact Alpha Technologies or the nearest Alpha representative. Save this document for future reference.

To reduce the risk of injury or death and to ensure the continued safe operation of this product, the following symbols have been placed throughout this manual. Where these symbols appear, use extra care and attention.

ATTENTION:

The use of ATTENTION indicates specific regulatory/code requirements that may affect the placement of equipment and /or installation procedures.

NOTE:

A NOTE provides additional information to help complete a specific task or procedure.

CAUTION!

The use of CAUTION indicates safety information intended to PREVENT DAMAGE to material or equipment.

WARNING!

WARNING presents safety information to PREVENT INJURY OR DEATH to the technician or user.

1.0 Introduction

The AlphaNet DSM Series Model XP-EDH-A External DOCSIS Transponder manages network powering through the existing cable modem infrastructure.

A single transponder can monitor and manage one power supply and batteries. The transponder transmits data to a management system over the network's existing infrastructure. Standard SNMP (Simple Network Management Protocol) provides access by any SNMP manager. Status Monitoring information is compatible with ANSI/SCTE HMS standards.

The AlphaNet DSM Series transponder provides the tools needed to manage today's network power requirements, and the ability to upgrade for tomorrow's needs.

Features:

- DOCSIS 1.1 certified
- Uses existing headend equipment
- Compatible with ANSI/SCTE HMS standards
- Single transponder supports a variety of power supply models: XM2, XM, AM, ZTT series
- Embedded Web server for remote diagnostics

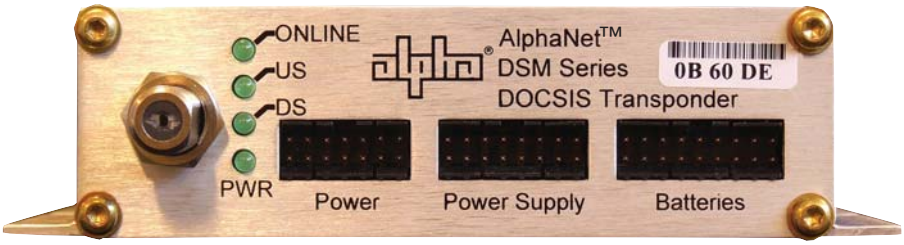


Fig. 1-1, AlphaNet DSM Series Model XP-EDH-A, External DOCSIS Transponder, Front Panel

1.1 System Overview

The XP-EDH-A is designed for use with the following standby power supplies:

- XM2
- XM
- AM/AP
- ZTT, ZTT+

The transponder hardware is the same for all applications and harness kits are available for specific configurations.

The XP-EDH-A receives data from a Universal Status Monitoring Card on XM/XM2 series power supplies, from the status monitor connector on Lectro ZTT power supplies, or from the RPM card on AM power supplies. The transponder and power supply can be network managed through your existing CMTS.

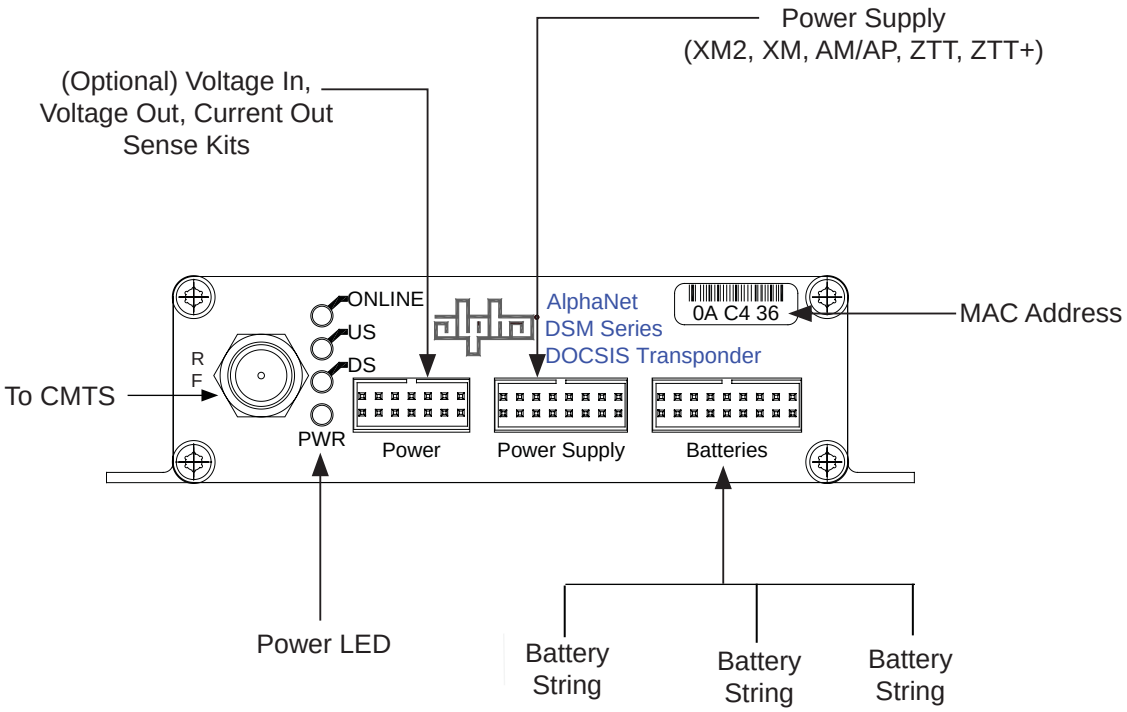


Fig. 1-2, XP-EDH-A Front Panel

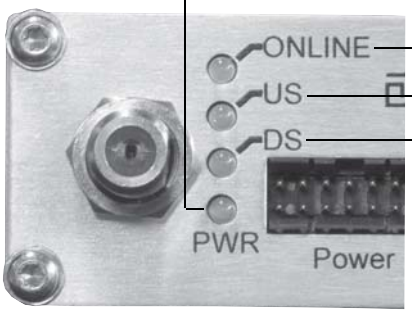
Number of Batteries	Number of Strings (Voltage)
3	single 36VDC
4	single 48VDC
6	dual 36VDC
8	dual 48VDC
12	triple 48VDC

Table 1-1, Number of Batteries and Strings

1.2 LED Indicators

The XP-EDH-A contains a DOCSIS 1.1 cable modem. The front panel contains one RF connector and three multi-pin connectors.

The four LEDs indicate the following:



POWER: Indicates device has power	
OFF:	No power.
ON:	Power on. (Battery harness connected to a battery string.).
ONLINE: Indicates a two-way RF (radio frequency) connection.	
OFF:	No communication.
Flickering ON:	Scanning for CMTS connection
ON:	Ongoing communication online with CMTS.
US (Upstream activity): Indicates data being transferred to the transponder	
Flashing ON and OFF:	Normal operation.
OFF:	No power or malfunctioning transponder.
DS (Downstream activity): Indicates data being transferred from the transponder	
Flashing ON and OFF:	Normal operation.
OFF:	No power or malfunctioning transponder.

Fig. 1-3, LED Status

1.3 MAC Address

Each transponder is assigned a unique Media Access Control (MAC) address, which is used to communicate with the network. The first 6 digits of the MAC address (the Organizational Unique Identifer (OUI)) for the transponder is 00-03-08. The complete address is located on the label on the top of the device and in this example is 00 03 08 0B 6F DA.

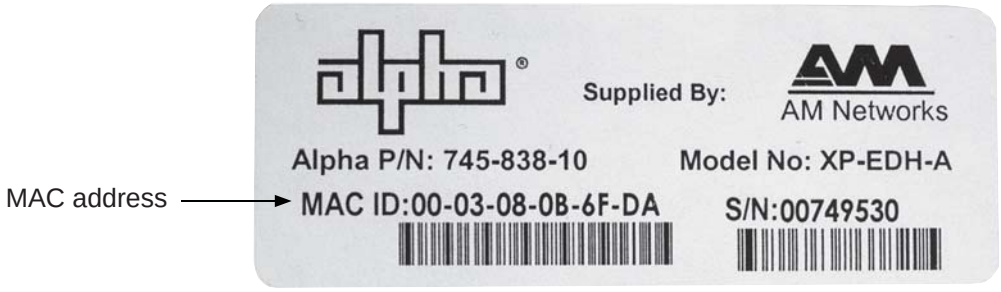


Fig. 1-4, MAC Address Label

2.0 Installation

Before installing the XP-EDH-A into a power supply, review your system requirements and determine the number of cable assemblies you need to monitor your HFC standby power supplies.

Note the following:

- The types and quantities of each power supply type
- Number of individual batteries per site (if you plan to increase the number of batteries in the future, consider ordering additional battery harnesses)
- Length of required battery harness (The standard 4 ft length battery harness is used in the typical power supply cabinet where one to three battery strings are mounted in the trays underneath the power supply shelf. If necessary, a 20 ft battery harness is available.)
- The required number of interface cards (RPM, USM, USM2.5, etc.)
- Number of 110V or 220V powered sites

NOTE:

The procedure for installing the XP-EDH-A into any supported power supply involves general information, (information that is common to all the power supplies), and information specific to an individual type of power supply. These installation instructions are divided into two sections to reflect this. It is recommended that you read through the general instructions and then take note of any information specific to your power supply.

Also, installation of this product involves both field installation and the configuration of the system, including network security, SNMP set-up, and other system provisioning. While those two procedures are handled independently, they are presented together in the section specific to your power supply.

2.1 General Installation Information for Supported Power Supplies

There are a few basic steps to follow to install the XP-EDH-A into supported power supply sites. The steps are either field steps or system configuration steps, and can be performed independently.

Field installation steps are:

1. Mounting the transponder
2. Disconnecting the DC power
3. Wiring the battery harness
4. Connecting the power supply interface cables
5. Confirming the RF drop

System configuration steps are:

6. Installing and compiling the AM MIBS
7. Provisioning the network, MAC address
8. Setting the DOCSIS configuration file options

Finally:

9. Verifying the operation

Detailed information on each of these steps follow.

2.0 Installing the Transponder, continued

2.1 General Installation for Supported Power Supplies, continued

2.1.1 Mounting the Transponder

- Place the transponder on the shelf inside the cabinet next to the power supply. Do not place the transponder on top of the power supply.
- Maintain access to the front of the transponder to ease the connection of the cables.
- Ensure the cabinet door can close without damaging the cables.
- If appropriate, tie-wrap the harness to the handles on the inverter drawer.

NOTE:

Depending on the type of enclosure and the power supply you are using, it may be necessary to orient the Service Power Inserter (SPI) vertically to provide space for the transponder.

CAUTION!

Backup capability is suspended with the DC breaker in the OFF position.

2.1.2 Disconnecting DC Power

- Place the DC breaker in the OFF position

2.1.3 Configuring the Interface Card

Each power supply contains an interface card which provides the common communication layer between the power supply and the transponder. The settings needed for your power supply are located in the section specific to your power supply.

2.1.4 Wiring the Battery Harness

CAUTION!

Incorrect connections may damage the equipment and invalidate the warranty. Double-check all connections.

- Prior to connecting the cables to the transponder, make all harness connections to the batteries and interface connectors on the power supply. See the battery diagrams for your specific power supply.
- Double-check all connections. Incorrect connections may damage the transponder or the power supply. Correct connections at the batteries are extremely important to the proper operation of the power supply.
- Ensure the the high current carrying cables and jumpers (heavy gauge black and red cables) remain in direct contact to the battery terminals.
- Never place the transponder battery harness lugs between the current carrying jumper/cable lugs and the battery terminals. See the power supply installation manual for more information.
- In some cases there are more battery harness leads than there are batteries. Connect all unused lugs to the same terminal as the V(-) lead, the same terminal where the heavy gauge black cable from the inverter is connected. This prevents residual voltage from being detected by the transponder.

2.1.5 Connecting the Power Supply Interface and Measurement Cables

- Connect the power supply interface and measurement cables to the power supply. Connections are dependent on the type of power supply configuration you are using. See the section specific to your configuration.
- It is important to be able to measure the site input line voltage. If you are not using a USM2.5/XM2 power supply, then it is recommended you use a transformer (110V and 220V available) to sample the commercial power at the site. While it does not power the transponder, it makes it possible for the transponder to report the actual line voltage. An additional transformer is not necessary when using a USM2.5/XM2 power supply.
- Use a surge protector within the cabinet when you are using a transformer to measure line voltage. Most cabinets come equipped with a duplex outlet.

2.1.6 Confirming the RF Drop

- An RF drop is required at the power supply site. The RF drop should not have plant voltage.
- The transponder contains a DOCSIS 1.1 cable modem. The downstream level (DS) into the transponder should be between -15 and +15 dBmV.

2.1.7 Provisioning Network Connectivity

The transponder's cable modem must be recognized by the CMTS as a valid device, to be able to obtain an IP address from the DHCP server, locate the TFTP and TOD servers, and communicate with the SNMP management server (trap receiver). Different security methods are used to insure network integrity, some common issues are:

- A "subscriber account" (where the subscriber is the transponder) may be required for each transponder.
- The transponder's MAC address may have to be pre-loaded into the CMTS.
- MAC filtering may have to be modified to allow MAC addresses starting with 00:10:3f:xx:xx:xx to be registered.
- For SNMP access, UDP ports 161 & 162 must not be blocked.
- Firewalls must allow communication between the cable modem and the various servers noted above.
- If the address of the TFTP and/or TOD server is different than the DHCP server, the response from the DHCP server must contain the TFTP and TOD addresses.

2.1.8 Configuring AM MIBS

- This step is not performed in the field, but at the network end of the installation.
- There are two propriety MIBs (Management Information Base) from AM Networks needed to configure the XP-EDH-A. See Section 4.0, Proprietary Management Information Bases (MIBs) for detailed information.

2.1.9 Setting the DOCSIS Configuration File Options

- This step is performed at the network end of the installation.
- This file supplies the security and community string settings for the system, as well as the software upgrade parameters. Set the community strings, matching your DOCSIS cable modems. The following is an example:

Sets Read-Write Community string. Set the IP addresses and community strings to fit your system.

```
SNMP MIB Object (11) [Len=21]:docsDevNmAccessStatus.1/4
SNMP MIB Object (11) [Len=21]:docsDevNmAccesslp.1/192.168.1.0
SNMP MIB Object (11) [Len=21]:docsDevNmAccesslpMask.1/255.255.255.0
SNMP MIB Object (11) [Len=25]:docsDevNmAccessCommunity.1/"RWRWRWRW"
SNMP MIB Object (11) [Len=21]:docsDevNmAccessControl.1/3
```

Sets Read-Only Community string. Set the IP addresses and community strings to fit your system.

```
SNMP MIB Object (11) [Len=21]:docsDevNmAccessStatus.2/4
SNMP MIB Object (11) [Len=21]:docsDevNmAccesslp.2/192.168.1.0
SNMP MIB Object (11) [Len=21]:docsDevNmAccesslpMask.2/255.255.255.0
SNMP MIB Object (11) [Len=25]:docsDevNmAccessCommunity.2/"RORORORO"
SNMP MIB Object (11) [Len=21]:docsDevNmAccessControl.2/2
```

Sets firmware download parameters.

```
Software Upgrade Filename(9) [Len=24]:"MODEM_Firmware_file.bin"
SNMP MIB Object (11) [Len=20]:docsDevSwAdminStatus.0/2
Software Upgrade TFTP Server (21) [Len=4]:192.168.1.51
```

Sets Code Verification Certificate (CVC)

```
Manufacturer Code Verification Certificate (32) [Len=254]: 30 82 03 1A 30 82...
Manufacturer Code Verification Certificate (32) [Len=254]: 04 0A 13 11 41 4D...
Manufacturer Code Verification Certificate (32) [Len=254]: 04 0C 30 0A 06 01...
Manufacturer Code Verification Certificate (32) [Len=36]: 11 A3 41 A6 A7 D9....
```

2.1.10 Verifying Operation

- After the connections are complete and the transponder's online LED is on solid, indicating network connectivity, verify the site is visible on the appropriate cable modem or computer network, and that all parameters being monitored are visible and accurate.
- Any standard Web browser on a personal computer configured for network connectivity to the transponder should be able to read the XP-EDH-A Web interface by simply pointing the Web browser to the IP address of the transponder (for example, `http://10.1.3.65)`.
- Confirm that all cable harnesses are neatly dressed within the enclosure.
- Verify that you can close the cabinet door, and move the battery tray in and out, without contacting or damaging any of the cables.

3.0 Installation Instructions for Specific Power Supplies

These are specific installation instructions for standby power supplies supported by the XP-EDH-A transponder. Each set of instructions include the interface card settings, a system diagram, and the output voltage calibration needed to successfully operate.

NOTE:

All settings and instructions specified here supercede information found in previous manuals.

NOTE:

When monitoring commercial line power, the XM2 (with the USM2.5 card) does not require an input voltage transformer because the USM2.5 card provides a scaled voltage representing the line input to the power supply. In this situation, the transponder makes the measurement via the interface cable connected to the USM2.5 card.

3.1 Alpha XM2 Series

1. If commercial power is present at the site and the power supply is currently being powered by commercial AC line voltage, then turn the battery breaker OFF on the inverter module.

NOTE:

Turning the battery breaker OFF disables standby power.

2. Determine the characteristics of the power supply, such as the inverter voltage (36 or 48), and the maximum capable output current (typically <20A or >20A).
3. Slide the inverter drawer out to gain access to the switches or jumpers located on the various types of USM2 and USM2.5 cards. If you need to install a USM*x* card, refer to the manual supplied with the card and complete the installation process.
4. Refer to the following diagram and adjust the switch settings to match your power supply.
5. Close the inverter module and tighten the retaining screws.

ATTENTION:

Alpha XM and XM2 power supply installations using USM2 (both new and old versions) and USM2.5 cards require switch/jumper settings to be made for proper operation.

3.1.1 USM2.5 Jumper Settings

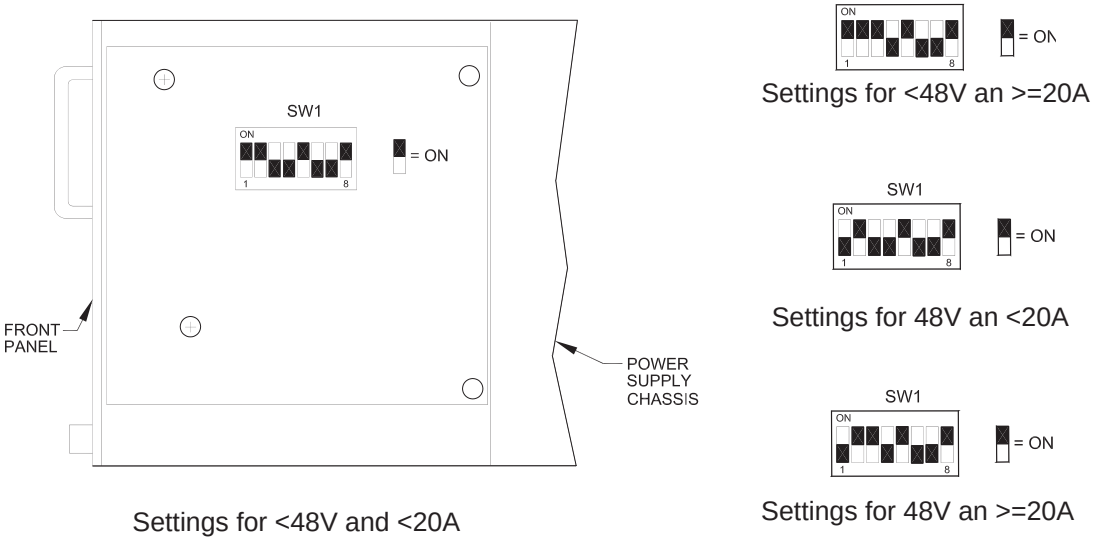


Fig. 3-1, USM2.5 Switch/Jumper Settings

3.1 Alpha XM2 Series, continued

3.1.2 USM2 Jumper Settings

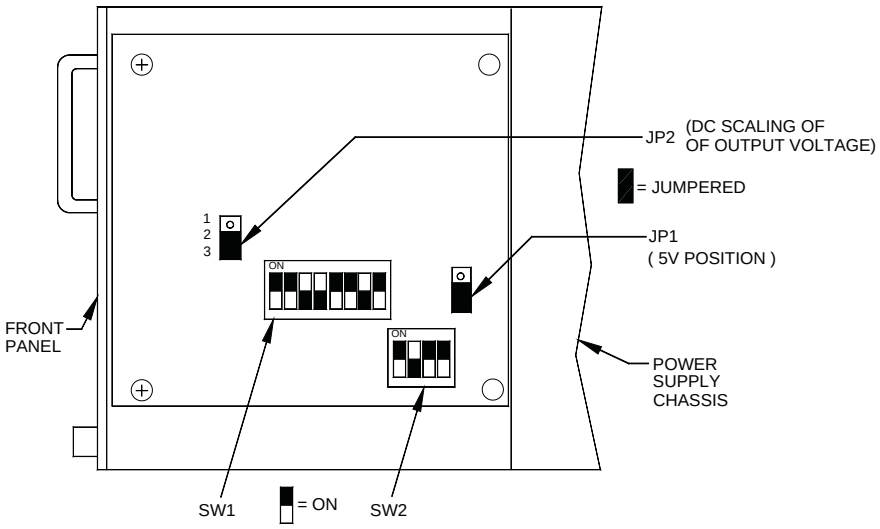


Fig. 3-2, USM2 Settings for <48V and <20A

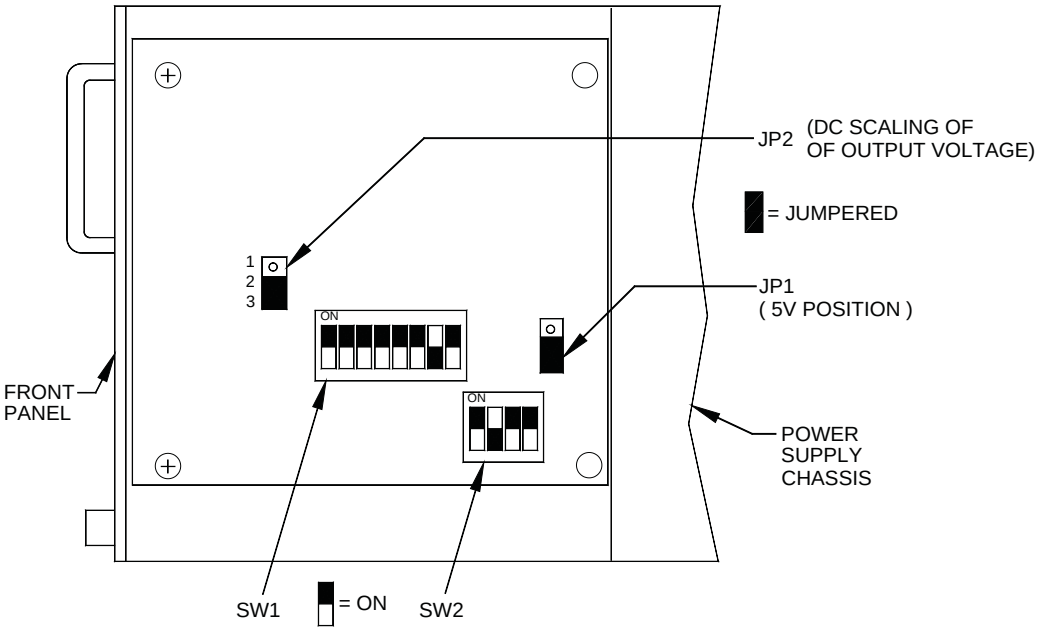


Fig. 3-3, USM2 Settings for <48V and >=20A

3.0 Installation Instructions for Specific Power Supplies, continued

3.1 Alpha XM2 Series, continued

3.1.2 USM2 Jumper Settings, continued

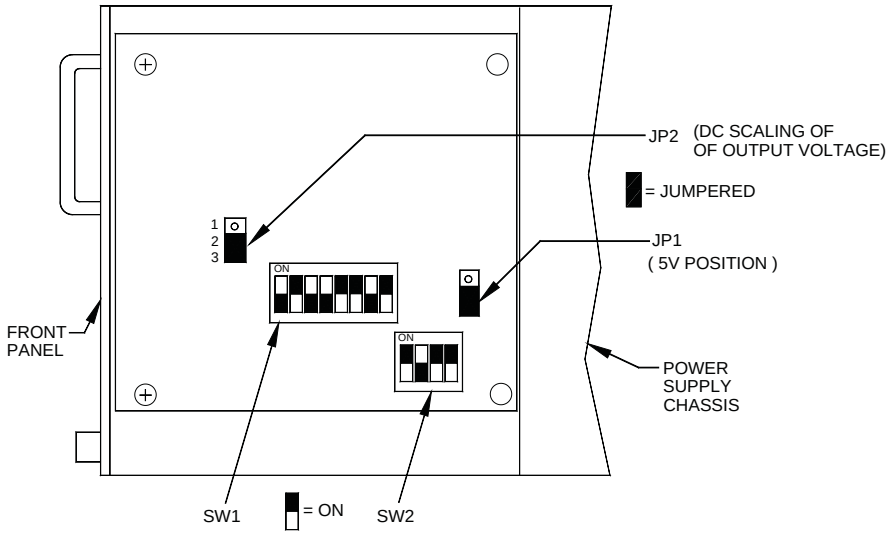


Fig. 3-4, USM2 Settings for 48V and <20A

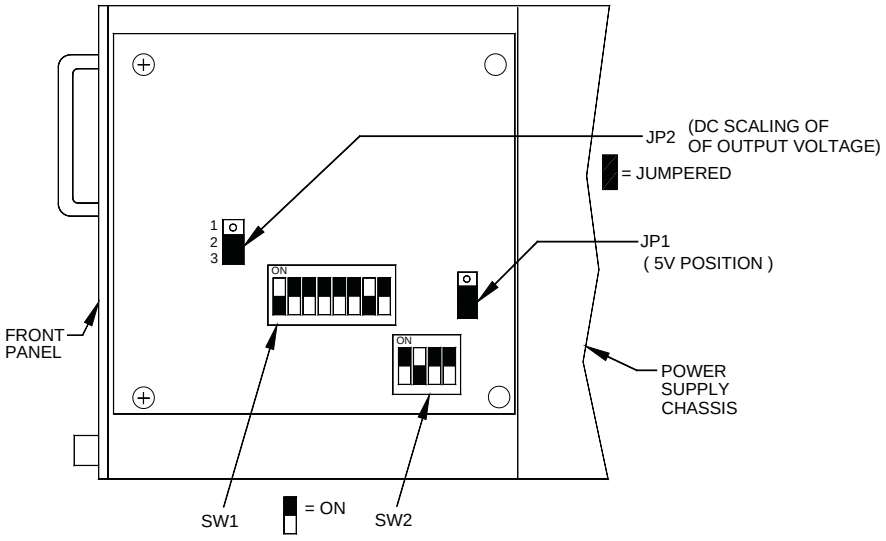


Fig. 3-5, USM2 Settings for 48V and >=20A

3.1.3 Connecting the XP-EDH-A to an XM2 Series Power Supply

Below is a cable installation guide diagram with interface, four batteries and power to an Alpha XM2 power supply with DC powering.

CAUTION!

Improper wiring may damage the unit and void the warranty.

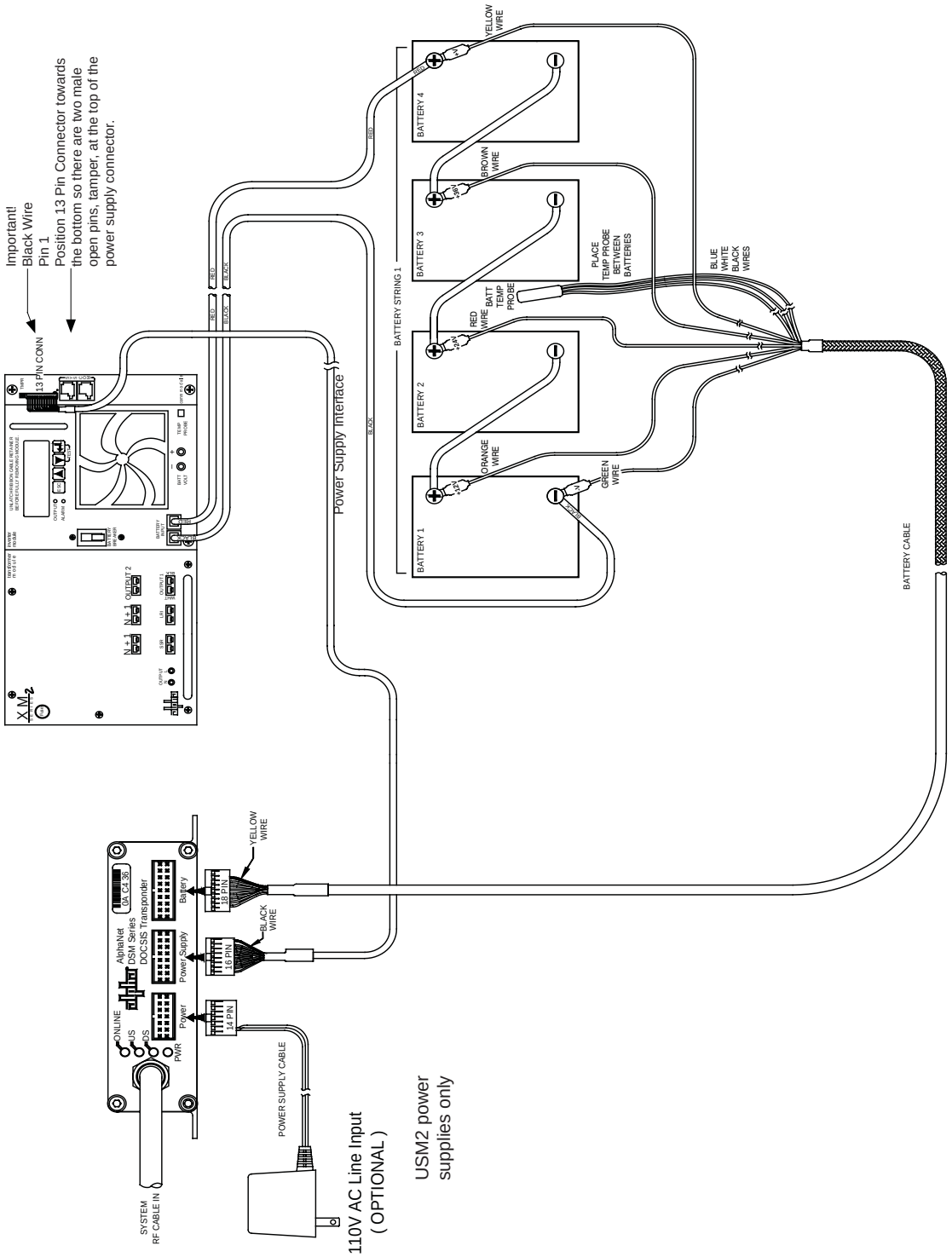


Fig. 3-6, XM2 Series Installation with Four Batteries

3.1.4 XM2 USM2 Output Voltage Calibration

You must calibrate the scaled output voltage of the USM*2* cards. To calibrate the output voltage, use a DC voltmeter and adjust the potentiometer located next to the white 15-pin connector of the USM*2* cards.

Determine if the power supply has a 60V or 90V nominal output.

NOTE:

This alignment procedure requires that the output neutral of the power supply is connected to the chassis of the power supply. If you are performing the alignment on a bench, verify this connection is made.

To make a universal adjustment:

- Connect a DC voltmeter, Common or Minus side to the battery, (black) test point on the inverter module front panel (or chassis); plus side to pin 4 of the USMx connector. For reference, Pin 1 of the transponder connecter is the black wire.
- For 60V XM2 power supplies, using USM2 or USM2.5 cards, adjust the potentiometer (visible through a small round hole next to the 15 pin white connector) until the DC voltage present at pin 4 is 9.00VDC.
- For 90V XM2 power supplies, using USM2 or USM2.5 cards, adjust the voltage at pin 4 to 13.5VDC.

3.1.5 Provisioning the Network for the XM2 Series

The transponder must be recognized by the CMTS as a valid device, be able to obtain an IP address and communicate with the SNMP management server.

1. Load the transponder's MAC address into the CMTS.
2. Compile the two MIBs onto a network manager or MIB browser software.
3. Setup SNMP using two AM propriety MIBs files
4. Set the AM MIBS points for the XM2 as follows:

```
For USM2
Oid: 1.3.6.1.4.1.2183.2.3.3.1.2 set to (2) (power supply
selection)
Oid: 1.3.6.1.4.1.2183.2.3.6.5 set to (1) (output voltage
scaling)
Oid: 1.3.6.1.4.1.2183.2.3.6.6 set to (1)for 110V powered
supply and (2) for 220V
```

   See Section 4.0, Proprietary Management Information Bases (MIBs) for detailed information.

5. Install and configure the DOCSIS configuration file. See Section 2.1.8 for a sample file.

3.2 Alpha XM Series Power Supply

NOTE:

You may require a chipset upgrade for the USM and XM inverter drawer for proper operation with the XP-EDH-A. Operating an XM series power supply with the XP-EDH-A with the wrong version chipset firmware may result in intermittent or incorrect operation of the power supply. Contact your Alpha representative for additional information.

1. If commercial power is present at the site, and the power supply is currently being powered by commercial AC line voltage, turn the battery breaker OFF on the inverter module.

NOTE:

When the battery breaker is turned OFF, standby power is disabled.

2. Slide the inverter drawer out to gain access to the USM card. Remove the USM/APM assembly from the inverter drawer. To install the USM and APM cards, refer to the manual supplied with the cards and complete the installation process.
3. Refer to the following diagram and adjust the jumper settings to match your power supply.
4. Reinstall the USM/APM assembly into the connector on the inverter drawer. Secure with the screw and bracket.
5. Close the inverter module drawer.

3.2.1 XM Series Jumper Settings

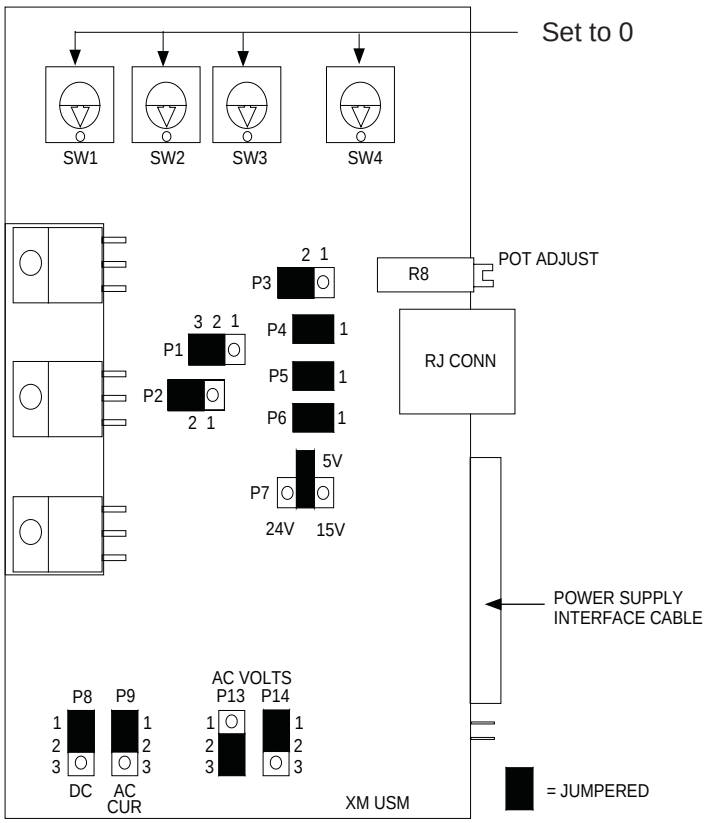


Fig. 3-7, XM/XP Power Supply Universal Status Monitor
(as viewed from rear of power supply with main control module partially removed)

3.2 Alpha XM Series, continued

3.2.2 Connecting the XP-EDH-A to a XM Series Power Supply

Follow the diagram below to make all connections between the transponder and the power supply site. The diagram is the cable installation guide drawing with interface, three batteries, and power to an Alpha XM power supply with DC powering.

CAUTION!

Improper wiring may damage the unit and void the warranty.

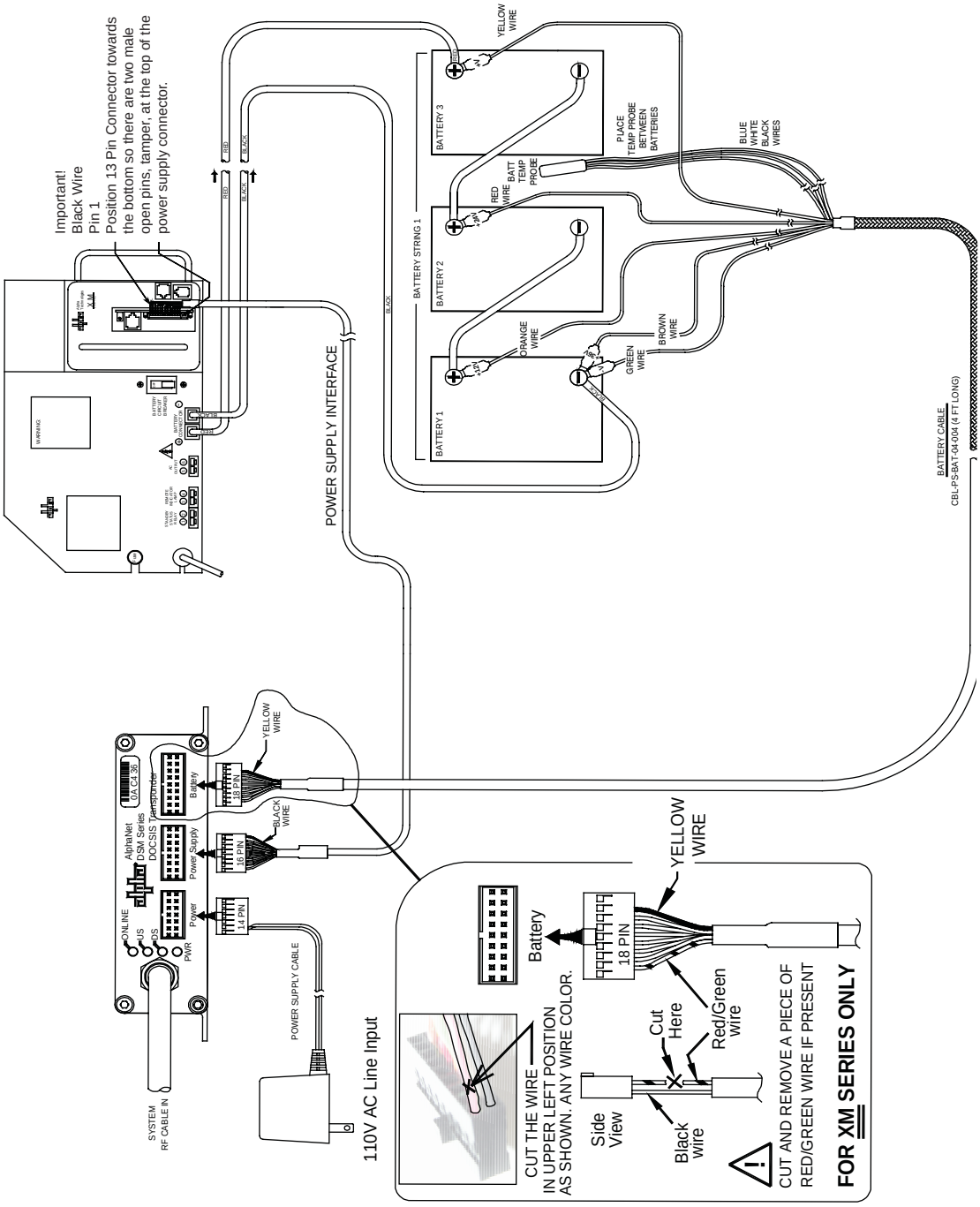


Fig. 3-8, XM Series Installation with Three Batteries

3.2.3 XM USM Output Voltage Calibration

You must calibrate the scaled output voltage of the USM cards. To calibrate the output voltage, use a DC voltmeter and adjust the potentiometer located next to the white 15-pin connector of the USM cards. Refer to the Alpha USM Installation manual for more information.

Determine if the power supply has a 60V or 90V nominal output.

NOTE:

This alignment procedure requires that the output neutral of the power supply is connected to the chassis of the power supply. If you are performing the alignment on a bench, verify this connection is made. For installed power supply sites, this connection is automatic inside the SPI box.

To make a universal adjustment:

- Connect a DC voltmeter, Common or Minus side to the battery, (black) test point on the inverter module front panel (or chassis); plus side to pin 4 of the USM connector. For reference, Pin 1 of the transponder connecter is the black wire.
- For 60V power supplies, using the USM card, adjust the voltage at pin 4 to 15.0VDC.
- For 90V power supplies, USM card, adjust the voltage at pin 4 to 22.5VDC.

3.2.4 Provisioning the Network for the XM Series

The transponder must be recognized by the CMTS as a valid device, be able to obtain an IP address and communicate with the SNMP management server.

1. Load the transponder's MAC address into the CMTS.
2. Setup SNMP using two AM propriety MIBs files.
3. Compile the two MIBs onto a network manager or MIB browser software.
4. Set the AM MIBS points for the XM as follows:

   ```
   Oid: 1.3.6.1.4.1.2183.2.3.3.1.2 set to (3) (power supply
   selection)
   Oid: 1.3.6.1.4.1.2183.2.3.6.5 set to (2) (output voltage
   scaling)
   Oid: 1.3.6.1.4.1.2183.2.3.6.6 set to (1)for 110V powered
   supply and (2) for 220V (input voltage measurement)
   ```

   See Section 4.0, Proprietary Management Information Bases (MIBs) for detailed information.
5. Install and configure the DOCSIS configuration file. See Section 2.1.8 for a sample file.

3.3 Alpha AM/AP Series Power Supply

1. If commercial power is present at the site, and the power supply is currently powered by commercial AC line voltage, turn the battery breaker OFF on the power supply.
2. If not already installed, install the RPM card. Refer to the instructions that come with this assembly.

WARNING!

Installing the XP-EDH-A transponder requires temporarily disconnecting the output of the power supply to the cable plant to insert one of the transponder harnesses in series with the power supply output. This is necessary so the transponder can measure both the output voltage and output current.

If a short power interruption is not feasible, you must use an alternate source of system power during the installation of the transponder.

3.3.1 Connecting the XP-EDH-A to an AM/AP Series

Follow Fig. 3-9 to make connections between the transponder and the power supply site.

Figure 3-9 is the cable installation guide for the power supply interface, three batteries, and the Alpha AM/AP power supply.

CAUTION!

Improper wiring may damage the unit and void the warranty.

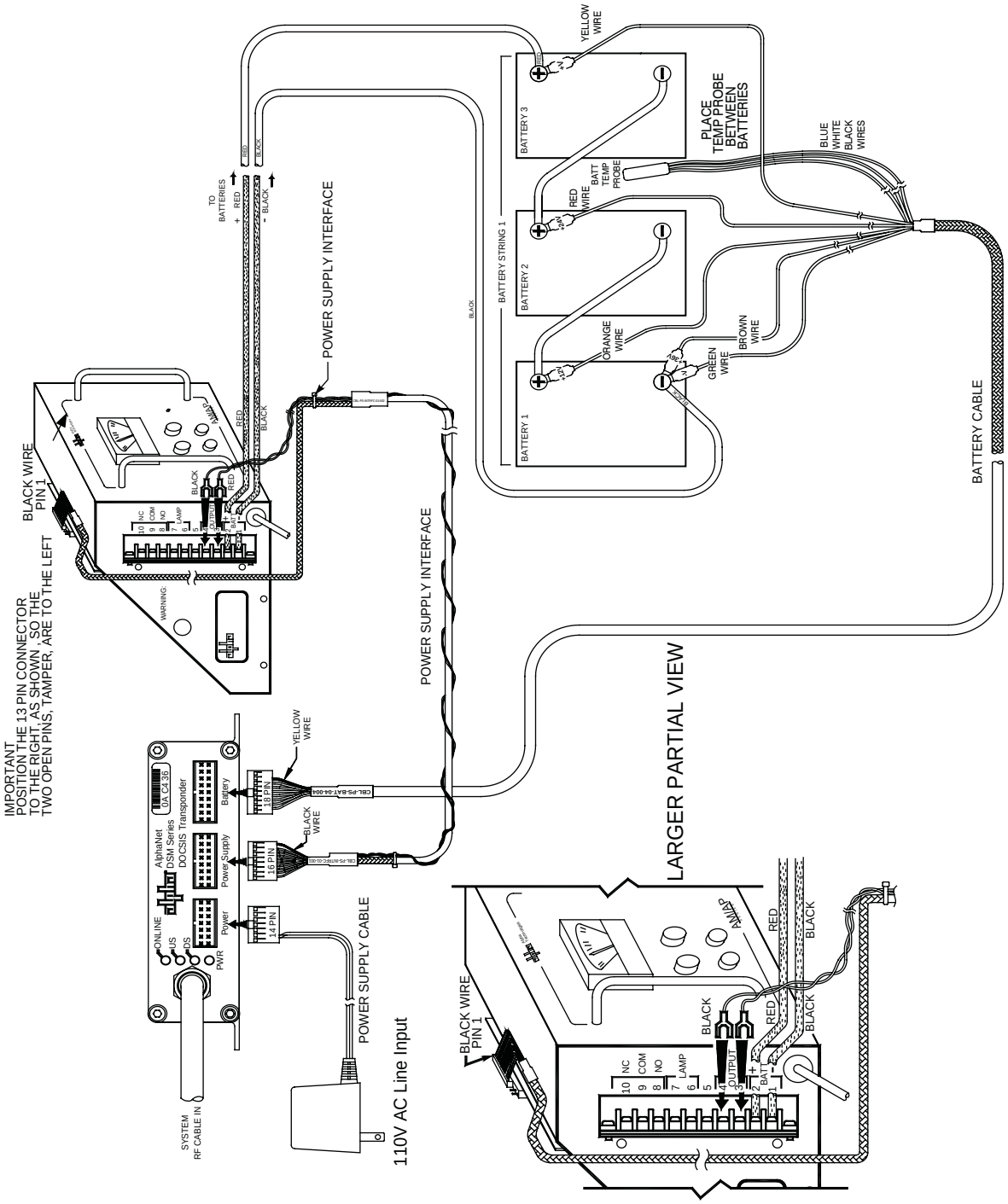


Fig. 3-9, AM/AP Series Installation with 3 Batteries

3.3.2 AM/AP Series Output Voltage Calibration

No calibration is necessary for the AM/AP power supply.

3.3.3. Provisioning the Network for the AM/AP Series

The transponder must be recognized by the CMTS as a valid device and be able to obtain an IP address and communicate with the SNMP management server.

1. Load the transponder's MAC address into the CMTS.
2. Setup SNMP using the two AM propriety MIBs files.
3. Compile the two MIBs onto a network manager or MIB browser software.
4. Set the AM MIBS points for the AM/AP as follows:

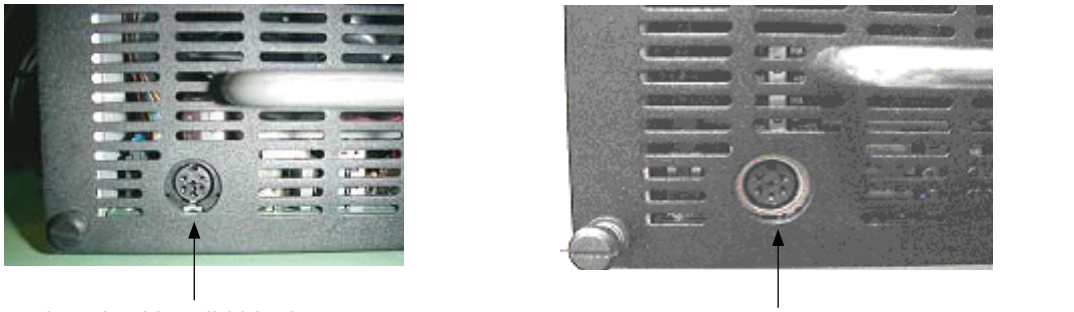
   ```
   Oid: 1.3.6.1.4.1.2183.2.3.3.1.2 set to (4) (power supply
   selection)
   Oid: 1.3.6.1.4.1.2183.2.3.6.5 set to (3) (acNormal for
   output voltage measurement)
   Oid: 1.3.6.1.4.1.2183.2.3.6.6 set to (1)for 110V powered
   supply and (2) for 220V (input voltage measurement)
   ```

   See Section 4.0, Proprietary Management Information Bases (MIBs) for detailed information.
5. Install and configure the DOCSIS configuration file. See Section 2.1.8 for a sample file.

3.4 Alpha/Lectro ZTT+ Series Power Supply

There are two forms of the Lectro ZTT+ Series power supplies. You can easily identify one type from the other by checking the round 6-pin DIN connector located on the lower left side of the front panel:

- Early units have a solid black DIN connector.
- Later units, including those being produced now, have a silver band around the DIN connector.



Early unit with solid black connector

Present unit with silver band on connector

Fig. 3-10, Lectro ZTT+ Series Power Supplies

Procedures for installing the XP-EDH-A with both types of Lectro ZTT+ Series power supplies follow and are differentiated by a silver or black designation.

CAUTION!

Installing the XP-EDH-A transponder at Alpha/Lectro ZTT+, or ZTT sites requires temporarily disconnecting the output of the power supply to the cable plant to insert one of the transponder harnesses in series with the power supply output. This is necessary so the transponder can measure both the output voltage and output current.

If a short power interruption is not feasible, you must use an alternate source of system power during the installation of the transponder.

3.4.1 Alpha/Lectro ZTT+ Installation (Silver and Black)

1. If commercial power is present at the site and the power supply is currently powered by commercial AC line voltage, turn the battery breaker OFF on the power supply.

NOTE:

Turning the battery breaker OFF disables the standby power supply.

2. Locate the transponder interface cable with the 6-pin type DIN connector. This harness has a selectable switch near the silver 6-pin shell. Place the switch in the ZTT+ Silver position or in the Black position depending on what type of power supply you are using.
3. Make all other harness connections following the diagram in Fig. 3-11.
4. If a site tamper switch is employed, connect the two lugs within the harness to the connections on the door switch.
5. Place the DC breaker back to the ON position.

3.4 Alpha/Lectro ZTT+ Series Power Supply, continued

3.4.2 Connecting the Alpha/Lectro ZTT+ (Silver and Black)

NOTE:

The Lectro ZTT+ installation diagram is the same for both the black and silver connector with the exception of the switch setting on the interface harness. For a black connector, set the switch to the ZTT+ black position and for a silver connector, set the switch to the silver position.

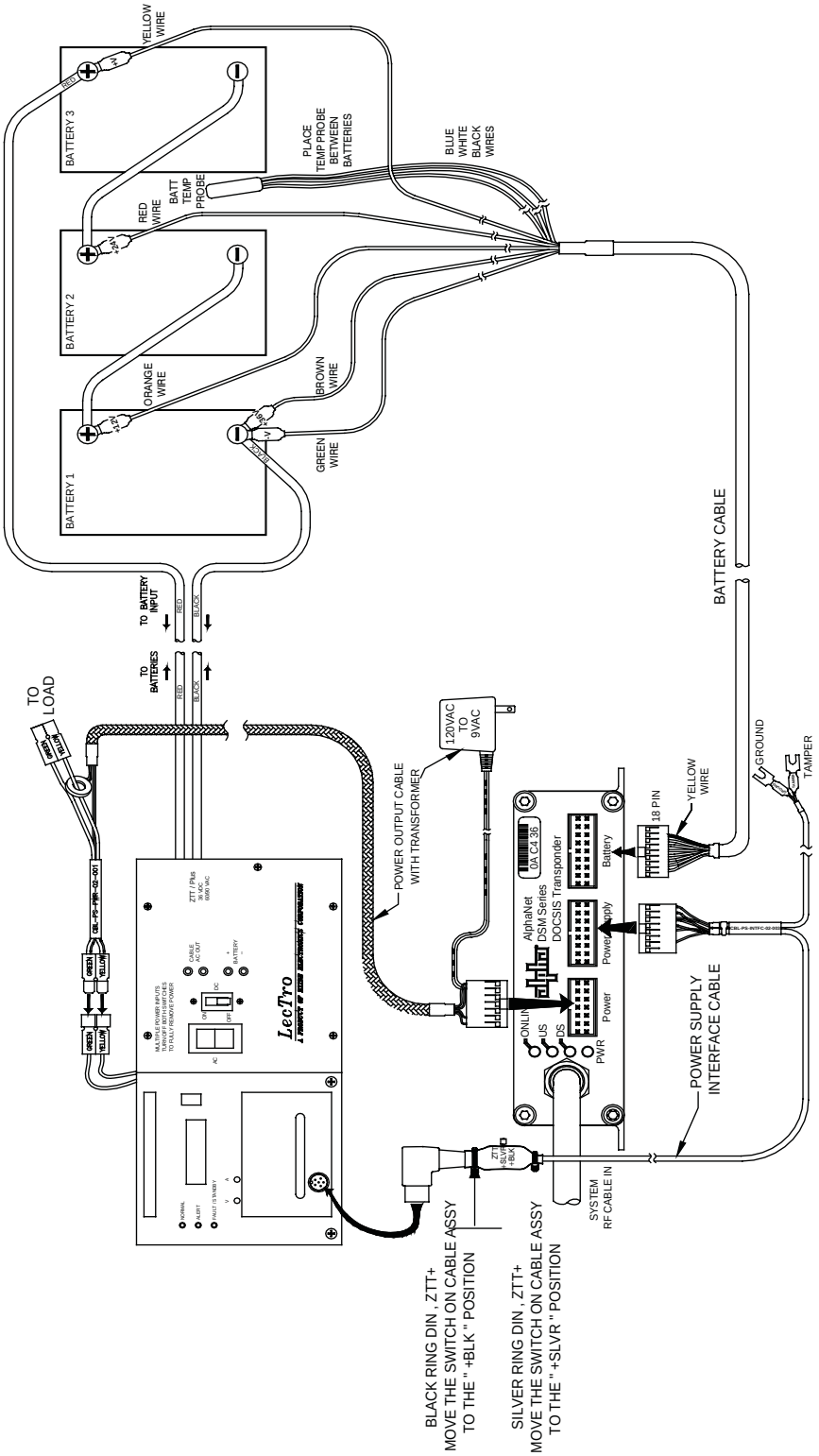


Fig. 3-11, Alpha/Lectro ZTT+ Series Silver and Black Installation

CAUTION!

Improper wiring may damage the unit and void the warranty.

3.4.3 Connecting the Lectro ZTT

Installation of the Lectro ZTT is the same as that for the ZTT+ series except for moving the switch located in the interface harness to the ZTT position.

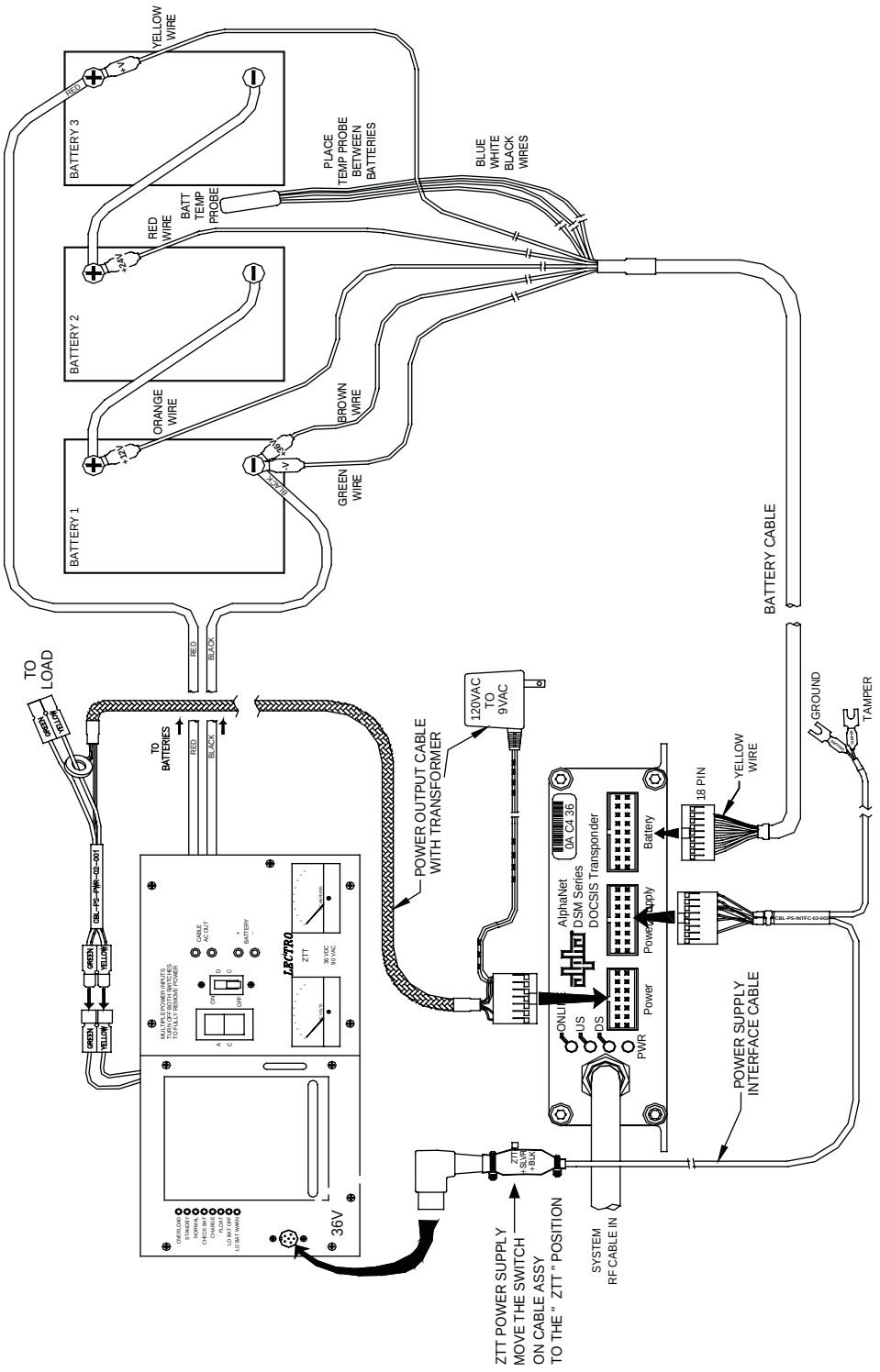


Fig. 3-12, Lectro ZTT Series Installation

3.4.4 Alpha/Lectro ZTT+ Series Output Voltage Calibration

No calibration is necessary for the ZTT+ Series power supplies.

3.4.5. Provisioning the Network for the Alpha/Lectro ZTT+ Series

The transponder must be recognized by the CMTS as a valid device, and be able to obtain an IP address and communicate with the SNMP management server.

1. Load the transponder's MAC address into the CMTS.
2. Setup SNMP using the two AM propriety MIBs files.
3. Compile the two MIBs onto a network manager or MIB browser software.
4. Set the AM MIBS points for the Lectro ZTT+/ZTT(silver or black DIN) as follows:

   ```
   Oid: 1.3.6.1.4.1.2183.2.3.3.1.2 set to (7) (ZTT+ power
   supply selection)
   Oid: 1.3.6.1.4.1.2183.2.3.6.5 set to (3) (acNormal for
   output voltage measurement)
   Oid: 1.3.6.1.4.1.2183.2.3.6.6 set to (1)for 110V powered
   supply and (2) for 220V (input voltage measurement)
   ```

   -or-

   ```
   Oid: 1.3.6.1.4.1.2183.2.3.3.1.2 set to (6) (ZTT power supply
   selection)
   Oid: 1.3.6.1.4.1.2183.2.3.6.5 set to (3) (acNormal for
   output voltage measurement)
   Oid: 1.3.6.1.4.1.2183.2.3.6.6 set to (1)for 110V powered
   supply and (2) for 220V (input voltage measurement)
   ```

   See Section 4.0, Proprietary Management Information Bases (MIBs) for detailed information.
5. Install and configure the DOCSIS configuration file. See Section 2.1.8 for a sample file.

4.0 Proprietary Management Information Bases (MIBs)

You need to use two proprietary MIBs from AM Networks to successfully configure the XP-EDH-A to use the power supplies described in this manual. Compile these two MIBs onto a network manager or MIB browser software.

To see a specific example of a MIBs file for a particular power supply, see that section of the manual.

The objects available are:

Object	Description
amDocsisDevicesTable	Oid: 1.3.6.1.4.1.2183.2.3.3.1.2 Set to the type of supply being monitored: alphaXM2 (2) default alphaXM (3) alphaAM/AP (4) lectroSentryII (5) lectroZTT (6) lectroZTTPlus (7)
amDocsisOPVoltageScaling	Oid: 1.3.6.1.4.1.2183.2.3.6.5 Set to 1 for DC powered transponders in Alpha XM2 type supplies using USM2 or USM2.5 cards. Set to 2 for DC powered transponders in Alpha XM type supplies using USM cards. Set to 3 for legacy power supplies (AM/AP, Lectro ZTT, ZTT+)
amDocsisInputVoltageMeasScaling	Oid: 1.3.6.1.4.1.2183.2.3.6.6 Set to 1 (default) for 110V powered supplies (Alpha or Lectro) Set to 2 for 220V powered supplies (Alpha or Lectro) *Note: Presently this object is used in conjunction with Alpha's 110V or 220V wall/brick transformers to sample the input line voltage.* The scaled voltage available in the Alpha USM2.5 cards report the input line voltage.

Table 4-1, Proprietary MIBs

5.0 Transponder Connector Pinouts

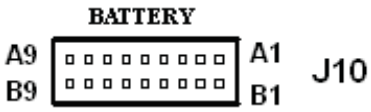
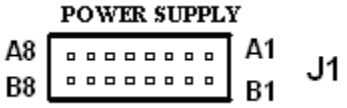
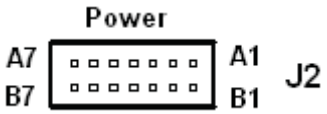
Connector	Pinouts Pins numbered right to left, facing front panel, A = top row, B= bottom row
Battery Interface 	A1 Battery 5+ A2 Battery 6+ A3 Battery 7+ A4 Battery 9+ A5 Battery 10+ A6 Battery 11+ A7 N/C A8 N/C A9 Chassis Ground B1 N/C B2 Battery V+ B3 Battery 3+ B4 Battery 2+ B5 Battery 1+ B6 Battery Reference V- B7 Temperature Probe Power B8 Temperature Probe Signal B9 Temperature Probe Ground
Power Supply Interface (16 Pin) 	Connector J1 A1 Charging Current A2 Major Alarm A3 Tamper A4 Minor Alarm A5 Inverter Status A6 Output Current1 A7 Total Battery Voltage A8 Output Current2 B1,B2 GND B3 AC Input Voltage B4 Inverter Control B5 Spare Analog Input B6 AC Power to the Transponder (Hot) B7 AC Power to the Transponder (Neutral) B8 Spare Input1
Power Supply Interface (14 Pin) 	Connector J2 A1 Output Current1 A2 Output Current2 A3 Output Current3 A4 N/C A5 N/C B1-B5 GND A6 Scaled AC Line Voltage Input B6 GND A7 AC to the Transponder (Hot) B7 AC to the Transponder (Neutral)

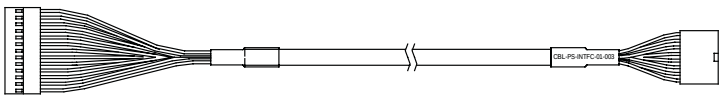
Table 5-1, Transponder Connector Pinouts

6.0 Cable Selection Guide

Interface cables :

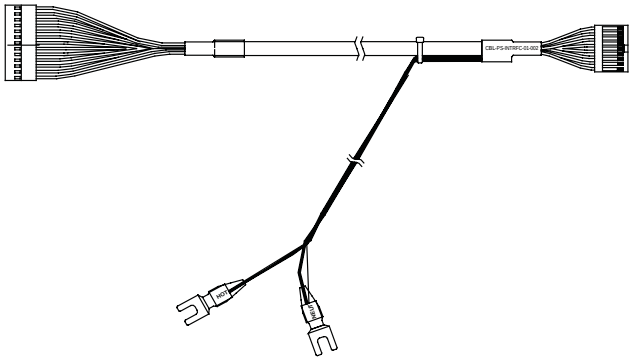
XM , XM2 power supplies

CBL-PS-INTFC-01-003
(Alpha P/N 875-565-10)



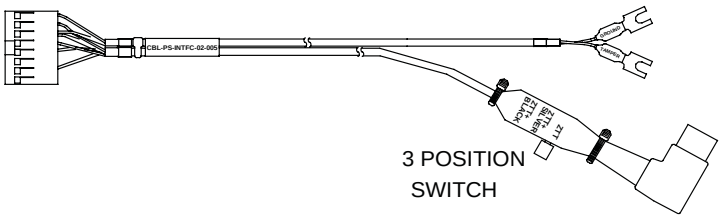
AM / AP power supplies

CBL-PS-INTFC-01-002
(Alpha P/N 875-564-10)



Lectro ZTT & ZTT+ power supplies

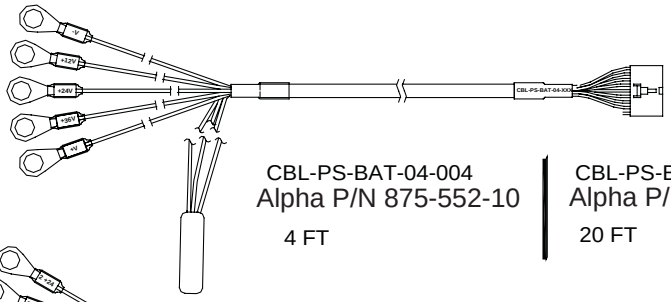
CBL-PS-INTFC-02-005
(Alpha P/N 875-566-10)



6.0 Cable Selection Guide, continued

Battery Cables:

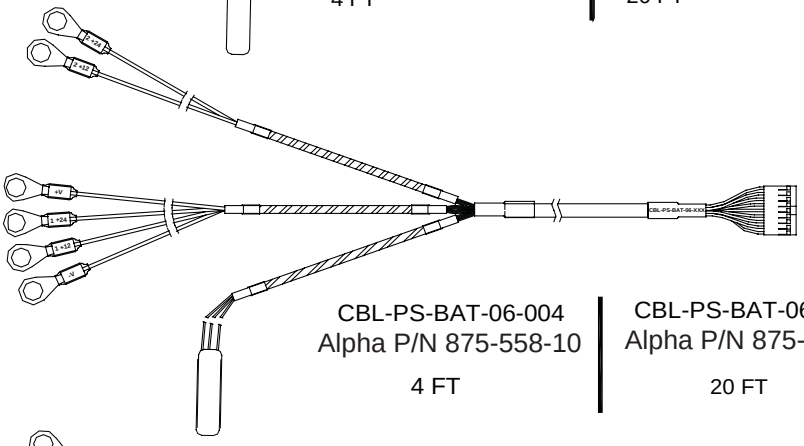
3 or 4 batteries



CBL-PS-BAT-04-004
Alpha P/N 875-552-10
4 FT

CBL-PS-BAT-04-020
Alpha P/N 875-559-10
20 FT

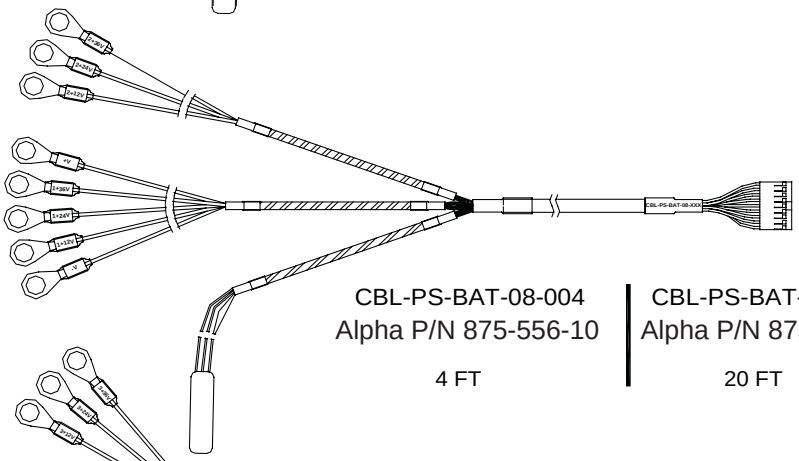
6 batteries



CBL-PS-BAT-06-004
Alpha P/N 875-558-10
4 FT

CBL-PS-BAT-06-020
Alpha P/N 875-559-10
20 FT

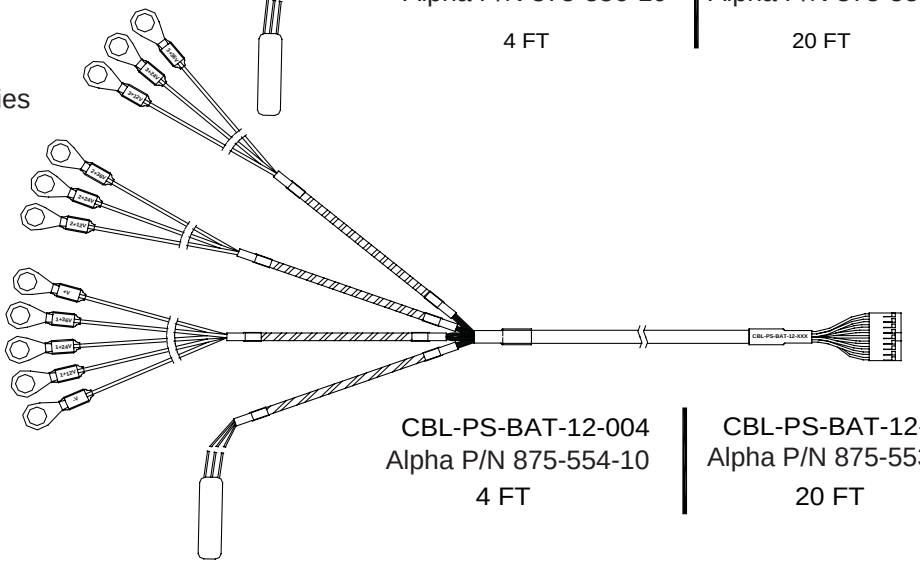
8 batteries



CBL-PS-BAT-08-004
Alpha P/N 875-556-10
4 FT

CBL-PS-BAT-08-020
Alpha P/N 875-555-10
20 FT

12 batteries



CBL-PS-BAT-12-004
Alpha P/N 875-554-10
4 FT

CBL-PS-BAT-12-020
Alpha P/N 875-553-10
20 FT

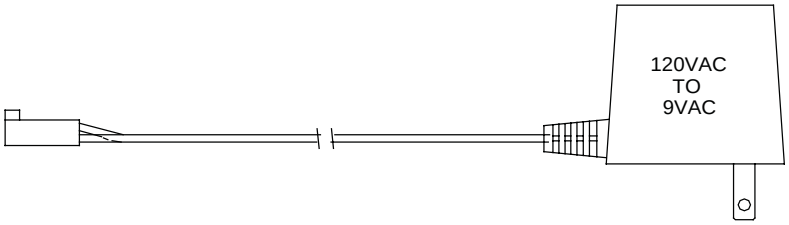
6.0 Cable Selection Guide, continued

Line Voltage Cables:

XM , XM2 , AM/AP, 120VAC

CBL-PS-PWR-01-001

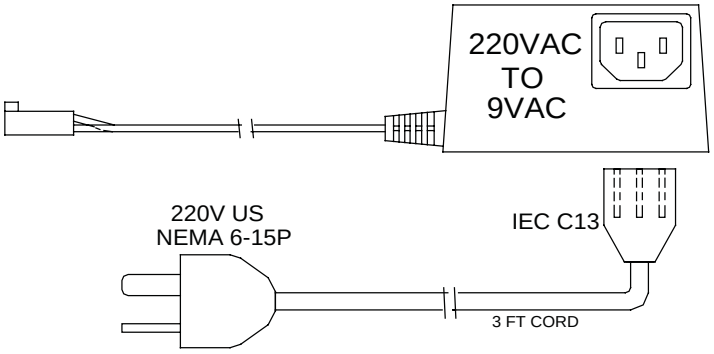
Alpha P/N 875-563-10



XM , XM2 , AM/AP, 220VAC

CBL-PS-PWR-03-002

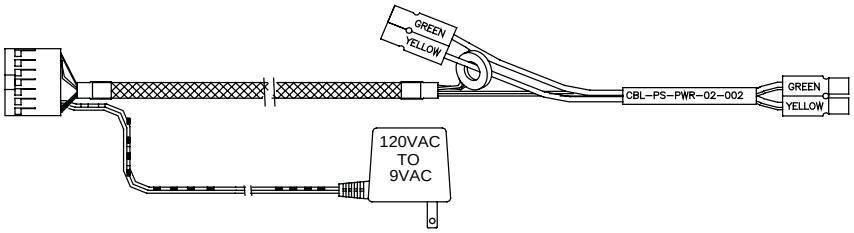
Alpha P/N 875-562-10



Lectro , 120VAC

CBL-PS-PWR-02-002

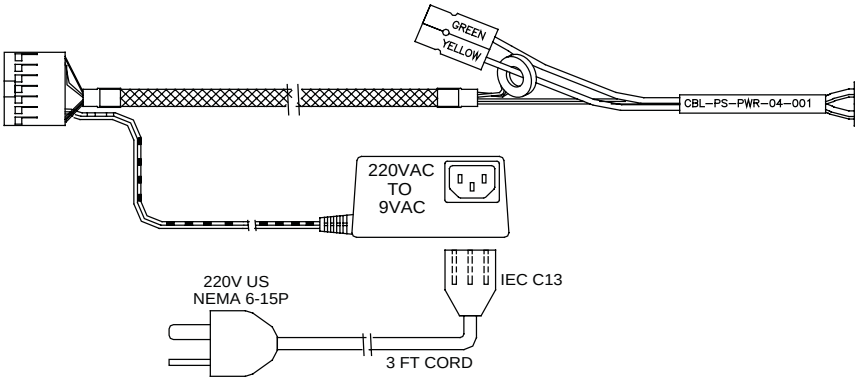
Alpha P/N 875-560-10



Lectro , 220VAC

CBL-PS-PWR-04-001

Alpha P/N 875-561-10



7.0 Dimensions and Specifications

7.1 Dimensions of XP-EDH-A

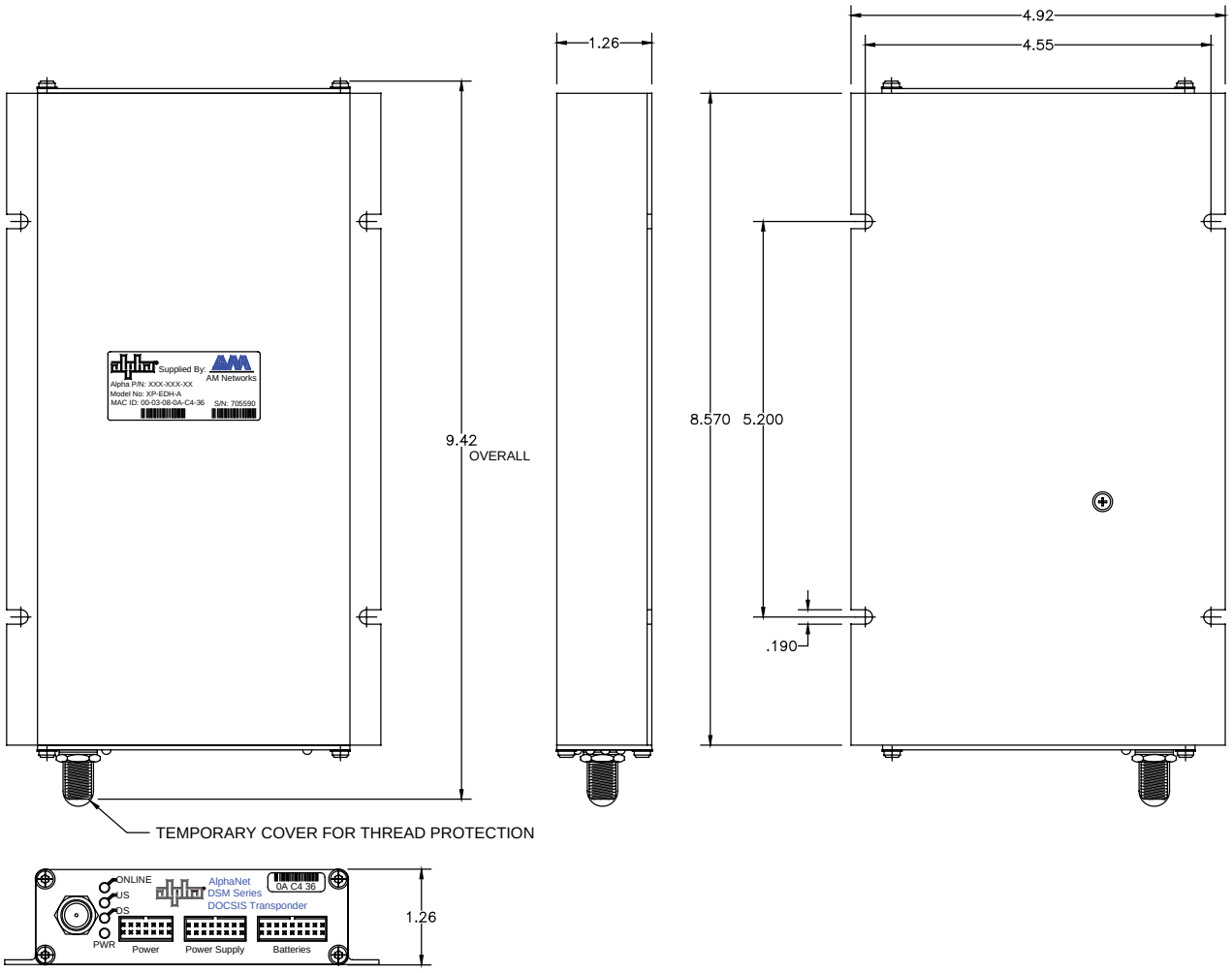


Fig. 7-1, XP-EDH-A Dimensions in Inches

7.2 Battery Cable Wiring Diagram

CAUTION!

The following diagram shows wiring to three batteries using a six battery cable.

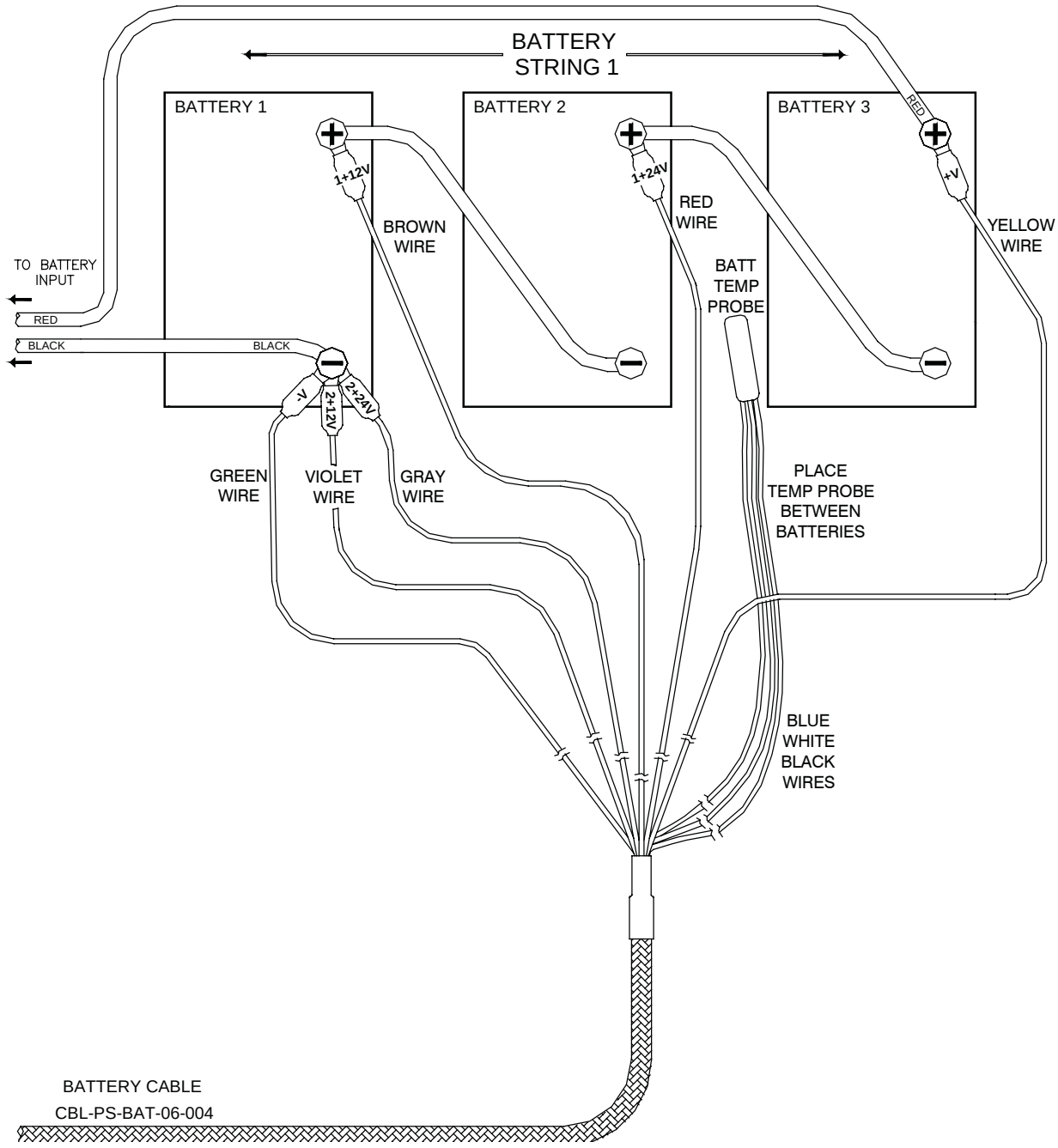


Fig. 7-2, Battery Cable Wiring Diagarm

8.0 Specifications

General Specifications

General

Model:	XP-EDH-A
Power Supplies Supported:	XM2 (requires USM2 or USM2.5) XM (requires USM) Lectro ZTT, ZTT+ AM (requires APM card)
DOCSIS Compatibility:	Firmware DOCSIS 1.1 Hardware DOCSIS 2.0
Monitoring Protocol:	SNMPv1

RF Transmit/Receive

Tx Frequency Range:	5 to 42MHz
Output Power:	8 to 55dBmV
Channel Bandwidth:	6MHz
Receive Center Freq Range:	91 to 857MHz (Standard, HRC, IRC channels)
Input Level:	-15 to 15dBmV

Monitored Parameters

Power Supply Data

Model:	XM2	XM	AM	ZTT Series
Major Alarm:	X	X	X	X
Minor Alarm:	X	X	X	X
Input Line Voltage:	X	X [1]	X [1]	X[1]
Output Voltage:	X	X	X	X [1]
Battery Voltage:	X	X	X	X
Output Current:	X	X	X	X [1]
Standby/AC Line Fail:	X	X	X	X
Equipment/Test Fail:	X	X	X	
Enclosure Door Status:	X	X	X	X
Remote Test Control:	X	X	X	X

Notes:

1 Requires optional cable assembly

Number of Battery String:	One to three of 36V or 48V
Battery Data:	Individual Battery Voltages Battery Compartment Temperature

Hardware

RF Cable Interface:	F-connector, female, 75Ohm
LED Indicators:	CMTS Registration Upstream Activity Downstream Activity Unit Power
Environmental:	-40 to 65°C 10 to 90% non-condensing humidity
Emissio ns:	EN50022 Class A and FCC Part 15 Class A (Installed in power supply enclosure system)
Immunity:	Surge Test per Specification (IEEE C62.41-1991) ESD Protection: ±8kV air discharge, ±6kV contact discharge as per (IEC 61000-4-2)
Warranty:	2 years
Dimensi ons (in):	5.2D x 8.6W x 1.3H

Management

NMS/EMS:	• Standard SNMP Management Tools
HMS MIBs:	

In addition to the standard DOCSIS MIBs, the transponder supports the following HMS MIBs:

SCTE 25-3 (HMS-022):	Interface
SCTE 36 (HMS-050):	Root
MIB SCTE 37 (HMS-072):	Tree
MIB SCTE 38-1 (HMS-026):	Property
MIB SCTE 38-2 (HMS-023):	Alarm MIB
SCTE 38-3 (HMS-024):	Common
MIB SCTE 38-4 (HMS-027):	Power Supply
MIB SCTE 38-6 (HMS-033):	Generator
MIB SCTE 38-7 (HMS-050):	TIB MIB

Ordering Information

Model Number	Description
XP-EDH-A	AlphaNet DSM Series External DOCSIS Transponder
CBL-PS-INT-01-003	Interface cable, XM, XM2 power supplies
CBL-PS-INT-01-002	Interface cable, AM/AP power supply
CBL-PS-INT-02-005	Interface cable, Lectro ZTT, ZTT+ power supplies
CBL-PS-PWR-01-001	Line voltage cable, XM, XM2, AM/AP, 120V
CBL-PS-PWR-03-002	Line voltage cable: XM, XM2, AM/AP, 220V
CBL-PS-PWR-02-002	Line voltage cable, Lectro 120VAC
CBL-PS-PWR-04-001	Line voltage cable, Lectro 220VAC
CBL-PS-BAT-04-004	Wire Kit, Battery Sense, 1x36V or 1x48V, 4'
CBL-PS-BAT-06-004	Wire Kit, Battery Sense, 2x36V, 4'
CBL-PS-BAT-08-004	Wire Kit, Battery Sense, 2x48V, 4'
CBL-PS-BAT-12-004	Wire Kit, Battery Sense, 3x48V, 4'

* Other Battery Sense Wire Kits available, call Alpha for more information

Power

Alpha Technologies

Alpha Technologies
3767 Alpha Way
Bellingham, WA 98226
USA
Tel: +1 360 647 2360
Fax: +1 360 671 4936
Web: www.alpha.com

Alpha Technologies Ltd.
4084 McConnell Court
Burnaby, BC, V5A 3N7
CANADA
Tel: +1 604 430 1476
Fax: +1 604 430 8908

Alpha Technologies
Europe Ltd.
Twyford House
Thorley
Bishop's Stortford
Hertfordshire
CM22 7PA
UNITED KINGDOM
Tel: +44 0 1279 501110
Fax: +44 0 1279 659870

Alpha Technologies GmbH
Hansastrasse 8
D-91126 Schwabach
GERMANY
Tel: +49 9122 79889 0
Fax: +49 9122 79889 21

Alphatec, Ltd
P.O. Box 56468
Limassol, Cyprus
CYPRUS
Tel: +357 25 375675
Fax: +357 25 359595

AlphaTEK ooo
Khokhlovskiy Pereulok 16
Stroenie 1
109028 Moscow
RUSSIA
Tel: +7 495 916 1854
Fax: +7 495 916 1349

Alphatec Baltics
S. Konarskio G. 49
Vilnius 2009
LITHUANIA
Tel: +350 5 210 5291
Fax: +350 5 210 5292

Alpha Technologies
5 Avenue Victor Hugo
F-92140 Calmart France
FRANCE
Tel: +33 3 41 90 07 07
Fax: +33 1 41 90 93 12

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